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50X1-HUM

CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

COUNTRY USSR

SUBJECT Scientific - Medicine, immunity

HOW PUBLISHED Monthly periodical

WHERE PUBLISHED Moscow

DATE PUBLISHED Jul 1950

LANGUAGE Russian

DATE OF INFORMATION 1950

DATE DIST. 15 Sep 1950

NO. OF PAGES 2

SUPPLEMENT TO REPORT NO.

50X1-HUM

THIS IS UNEVALUATED INFORMATION

SOURCE Veterinariya, Vol XXVII, No 7, 1950.

ON THE NATURE OF VIRUSES AND MICROBES

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As experimental results obtained at our institute and elsewhere show, any immunity, no matter against which infection, is a nonsterile, infectious immunity. In an immunized or hyperimmunized organism the microbes do not disappear, but are transformed into a virus or phagic form which is inactive and does not cause infection. An immune or hyperimmune serum, when introduced into the organism of an animal, transforms the microbe cells which are present in the organism into the phagic or virus form. A bacteriophage performs the same function: it transforms the microbes into another phagic form, one of the forms which combine readily with blood proteins. Immunization and hyperimmunization present classical examples of the transformation of microbes into a filterable form, while the isolation of initial microbe cultures from immune and hyperimmune sera furnished a visible proof of this transformation. The virus or phagic form of microbes combines with the proteins of the animal organism, as a result of which neutralization of the virus of the phage takes place. Immunity against viruses as well as microbes is conferred in this precise manner.

In the animal organism the filterable form of microbes is formed not only by hyperimmune sera and bacteriophage, but also under the action of antibiotics of nonorganic and organic origin. Moreover, phagocytes, i.e., cells of the reticulo-endothelial system, have the same effect. Upon capturing pathogenic microbes, they change them into the filterable form which readily combines with blood proteins. In this manner, the action of pathogenic microbes is neutralized. In other words, the action of hyperimmune sera, bacteriophages, antibiotics, and phagocytes is essentially the same and amounts to transformation of bacterial forms of microbes into filterable modifications.

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The kinds of matter against which an immunity may be established in the organism comprise substances of a living nature and living matter such as microbes, viruses, vaccines, phages, toxins, proteins, and allergens. From all these types of matter the initial living substance can be isolated. All antigens represent the simplest elementary living units of animal or plant life and as such are capable of forming the more complex unit, the cell.

On penetration of microorganisms into the body the proteins of the body change their configuration in such a manner that they acquire the capacity to combine with the virus or the filterable form of the microbe in question. In other words, antibodies are simply a combination of modified protein substance with the filterable form of the antigen. When the filterable modification of the microbe or the virus disappears, the special modification of protein substance (protein in a special antibody state) can no longer form or exist in the organism.

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